DOCUMENT RESUME

ED 451 351 CE 081 475

TITLE	Best Practices in School-to-Careers: The Manufacturing Industry.
INSTITUTION	Manufacturing Industries Careers Alliance, Washington, DC.; National Employer Leadership Council, Washington, DC.
SPONS AGENCY	National School-to-Work Opportunities Office, Washington, DC.
PUB DATE	2000-00-00
NOTE	25p.; For other documents in the "Best Practices in School-to-Careers" series, see CE 081 472-474.
AVAILABLE FROM	NELC, 1201 New York Ave., NW, Suite 700, Washington, DC 20005 ($4). Tel: 800-787-7788 (Toll Free); Web site: http://www.nelc.org. For full text: http://www.nelc.org/resources/MICA.pdf.
PUB TYPE	Reports - Descriptive (141)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	Academic Standards; Advisory Committees; Annotated Bibliographies; Career Awareness; Career Exploration; Case Studies; Change Strategies; Cooperative Planning; Demonstration Programs; *Education Work Relationship; Educational Change; Educational Cooperation; Educational Opportunities; *Educational Practices; Educational Resources; Employment Opportunities; Employment Qualifications; Entry Workers; Experiential Learning; Glossaries; Information Sources; Innovation; Internet; Job Skills; Job Training; Labor Needs; Linking Agents; *Manufacturing Industry; National Organizations; National Standards; Nonprofit Organizations; *Partnerships in Education; Professional Development; *School Business Relationship; Secondary Education; Skill Development; Student Certification; Systems Approach; Teacher Education; Transfer of Training; *Vocational Education; Work Experience Programs; World Wide Web
IDENTIFIERS	Connecticut (Hartford); Illinois (Peoria); National Employer Leadership Council; New York (Rochester); Ohio (Canton); Texas (Austin)

ABSTRACT

This booklet, which is part of a series demonstrating the scope of employer involvement in school-to-careers, highlights the efforts of six manufacturing employers and three "intermediary" organizations connecting workplace experiences to classroom learning for secondary education students. The introduction presents a series overview and lists the names, locations, and featured practice of the employers and organizations. The next sections examine manufacturing at the turn of the century; reasons why school-to-careers is an ideal strategy for addressing manufacturing skill needs; current manufacturing industry efforts to develop a skill standards and certification system; and how the employer participation model works with students and teachers. These employers and intermediaries and their best practices are profiled: (1) Caterpillar, Inc. (Peoria, Illinois); (2) The Timken Company (Canton, Ohio); (3) Kraft Foods, Inc. (Northfield, Illinois); (4) Maine Machine Products Company (South Paris, Maine); (5) Advanced Micro Devices (Austin, Texas); (6) Rochester Area Career Education Collaborative

Reproductions supplied by EDRS are the best that can be made
from the original document.

(Rochester, New York); (7) Eastman Chemical Company (Kingsport, Tennessee); (8) Connecticut Business and Industry Association (Hartford, Connecticut); and (9) Capital Area Training Foundation (Austin, Texas). The following items are also included: (1) an annotated list of eight organizations and resources; (2) a glossary; and (3) a discussion of steps to build on the National Employer Leadership Council's agenda. (MN)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 451 351

Best Practices in School-to-Careers

The Manufacturing Industry

A. Williams

1

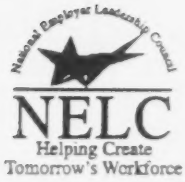
U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☒ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

National Employer Leadership Council
NELC
Helping Create Tomorrow's Workforce

Manufacturing Industry Career Alliance
MICA

CE 081425

BEST COPY AVAILABLE



NATIONAL ALLIANCE OF BUSINESS

National Employer Leadership Council
National Alliance of Business
1201 New York Avenue, NW
Suite 700
Washington, DC 20005
Phone: (800) 360-NELC
E-mail: nelc@nelc.org
Website: www.nelc.org

BEST COPY AVAILABLE

National Employer Leadership Council

The National Employer Leadership Council, an initiative of the National Alliance of Business, is a business membership organization dedicated to expanding and enhancing employer involvement in school-to-careers. The NELC advocates and supports school-to-careers initiatives combining classroom courses with real-life learning to ensure all students meet high standards and, therefore, are prepared for continuing education and the cutting-edge jobs of the 21st century. NELC members, and the NELC Leadership Board of senior business executives, are committed to sustaining the significant changes in teaching and learning taking place across the country as a result of school-to-careers.

Contact:

National Employer Leadership Council
c/o National Alliance of Business
1201 New York Avenue, NW, Suite 700
Washington, DC 20005
Phone: (800) 360-NELC
E-mail: nelc@nelc.org
Website: **www.nelc.org**

Manufacturing Industries Careers Alliance

The Manufacturing Industries Careers Alliance (MICA) is an alliance of the Center for Workforce Success of the Manufacturing Institute, the research and education affiliate of the National Association of Manufacturers, the Institute for Educational Leadership's Center for Workforce Development, the National Institute for Metalworking Skills, the AED Foundation (an affiliate of the Associated Equipment Distributors), and representatives from the chemical sector. MICA's purpose is to build business "intermediary" models that bridge the gap between school and careers. The Alliance's objectives are to foster the development of business-led intermediaries at the local, state and national level; improve their capacities to form sustainable alliances between industry and education; and train providers to enhance learning and work opportunities for youth. MICA initiatives engage firms in school-to careers, standards-based education, and in promoting promising practices.

Contact:

Phyllis Eisen
Vice President
The Manufacturing Institute
Executive Director
Center for Workforce Success
National Association of Manufacturers
1331 Pennsylvania Avenue, NW
Washington, DC 20004-1790
Phone: (202) 637-3011
E-mail: peisen@nam.org

Joan Wills
Director
Center for Workforce Development
Institute for Educational Leadership
1001 Connecticut Avenue, NW, Suite 310
Washington, DC 20036
Phone: (202) 822-8405 x103
E-mail: willsj@iel.org

Table of Contents

Introduction 3

Manufacturing at the Turn of the Century 4

School-to-Careers: Addressing Manufacturing Skill Needs 5

Skills and Certifications 6

Implementing School-to-Careers:
The Employer Participation Model 7

I. Working with Students 8

Career Awareness 8

Company Profile: Caterpillar, Inc., Peoria, Illinois 9

Company Profile: The Timken Company, Canton, Ohio 10

Career Exploration 10

Company Profile: Kraft Foods, Inc., Northfield, Illinois 11

Company Profile: Maine Machine Products Company, South Paris, Maine 11

Career Preparation 12

Company Profile: Advanced Micro Devices, Austin, Texas 12

II. Working with Teachers 13

Intermediary Profile: Rochester Area Career Education Collaborative, Rochester, New York 14

Company Profile: Eastman Chemical Company, Kingsport, Tennessee 15

Third Party Intermediaries 16

Intermediary Profile: Connecticut Business and Industry Association, Hartford, Connecticut 16

Intermediary Profile: Capital Area Training Foundation, Austin, Texas 17

Next Steps and Resources 17

Glossary of Terms 19

Introduction

This booklet is part of a series that demonstrates the scope and importance of employer involvement in school-to-careers. Each booklet in the series examines employer roles in specific industry sectors. This publication focuses on the importance of partnerships between educators and companies that rely on a skilled workforce for the manufacturing industry. It is the result of a partnership among the NELC, the National Alliance of Business, and the Manufacturing Industries Careers Alliance, an alliance of the Center for Workforce Success of the Manufacturing Institute, the research and education affiliate of the National Association of Manufacturers, the Institute for Educational Leadership's Center for Workforce Development, the National Institute for Metalworking Skills, the AED Foundation (an affiliate of the Associated Equipment Distributors), and representatives from the chemical sector.

Across the country, employers from all industries are supporting school-to-careers as a critical link in preparing students for future education and careers. School-to-careers has brought together employers, educators, students, and community leaders to build a coordinated series of activities that provide students with a clear understanding of the education and career options available to them and the skills and competencies required for success.

While employers are committed to improving the core academic achievement levels of all students and preparing them for success in all careers, employers in different industries can play unique roles in enhancing learning for specific students with particular interests and aptitudes. Together, the activities of all employers provide opportunities to connect with all students so they can learn, grow, and ultimately take control of their own educational and career goals.

Best Practices in School-to-Careers: The Manufacturing Industry highlights the efforts of six manufacturing employers and three "intermediary" organizations connecting workplace experiences to classroom learning to help young people develop skills for success. While each employer is recognized for a specific activity or series of activities, together they demonstrate the need to create multiple opportunities for young people to learn and grow:

1. **Advanced Micro Devices (AMD), Austin, Texas:** A comprehensive school-to-careers initiative.
2. **Caterpillar, Inc., Peoria, Illinois:** Helping young people explore and understand the wide opportunities in manufacturing careers.
3. **Eastman Chemical Company, Kingsport, Tennessee:** Providing learning opportunities for teachers.
4. **Kraft Foods, Inc., Northfield, Illinois:** Offering multiple opportunities to experience the world of work.
5. **Maine Machine Products Company, South Paris, Maine:** A small manufacturer providing career opportunities.
6. **The Timken Company, Canton, Ohio:** Applying skills learned in the classroom to the workplace.
7. **Capital Area Training Foundation, Austin, Texas (Intermediary Profile):** Supporting employer priorities in school-to-careers activities and workforce development.
8. **Connecticut Business and Industry Association, Hartford, Connecticut (Intermediary Profile):** Bringing businesses and educators together for enhanced success.
9. **Rochester Area Career Education Collaborative (RACEC), Rochester, New York (Intermediary Profile):** Providing professional development opportunities for educators.

Manufacturing at the Turn of the Century

The manufacturing industry faced significant changes throughout the course of the latter 20th Century. From July 1999 to July 2000, manufacturing employment numbered at 18.5 million, increasing by almost 850,000 jobs between 1992 and 1998. While slightly more than half (469,000) of these new jobs have been in high-tech industries, the main impact that technological growth has had on manufacturing has not been the number, but the quality of manufacturing jobs in America. Innovations in manufacturing processes and increased salary compensation have enabled manufacturing to become increasingly attractive to those seeking employment. United States manufacturing output is higher now

than at any other time during the nation's history. Manufacturing productivity has been increasing steadily for 20 years, outpacing the economy as a whole.

Today's economy is being fueled by revolutionary changes in information technology and expanded integration with the world economy. Together, these forces have significantly improved the state of the American workforce, as thinking and reasoning skills become more-valued commodities in the modern workplace. The technology revolution is evidenced in manufacturing, where the fastest-growing industries have been either heavy users or producers of technology: industrial machinery, electronics, instruments, and transportation equipment.

Given the changing course of work in the U.S., the biggest challenge facing manufacturers is finding workers with the skills required in today's manufacturing world. Driving this home is a recent National Association of Manufacturers (NAM) survey in which approximately 90 percent of manufacturers reported difficulties in funding qualified candidates in at least one job function.

School-to-Careers: Addressing Manufacturing Skill Needs

The future of American manufacturing depends not on the existence of enough quality, high-paying jobs, but enough quality, highly skilled workers to fill the demands of the 21st Century. In this era of fast-paced technological change, traditional educational systems can sometimes to adapt to the evolving skill sets and knowledge base today's students need to succeed in tomorrow's world.

Employers in the manufacturing industry recognize the role they play in shaping the workforce of the future. Employers have dedicated considerable resources and expertise to help improve K-12 education at both the community and national levels. They also recognize that, as employers who rely on new technologies to improve workforce productivity, they are uniquely suited to provide guidance to the academic community about how to prepare students for a technology-driven future.

School-to-careers (STC) is an ideal strategy for showing young people how education is relevant to their hopes and dreams and helping them progress through education and careers to develop the basic and

specific skills they will require if they choose to pursue careers in manufacturing. STC also allows employers to play important roles in providing opportunities for those interested in developing the employability and industry-specific skills required for success in the knowledge economy.

Skills and Certifications

STC adds the greatest value when it helps students develop a mastery of a broad set of academic, foundation, and technical skills:

- Academic skills are those primarily taught and learned in schools, often referred to as "the basics." These skills cut across all disciplines, and are required for success in life – both personally and at work.
- Foundation skills, also referred to as "soft" skills or "employability" skills, encompass characteristics such as attitude, attendance habits, and the ability to work in teams. Every industry requires all of these foundation skills in varying degrees.
- Technical skills are skills and knowledge developed for specific careers or jobs.

The manufacturing industry is working toward developing a set of national skill standards demanded by the industry. In March 1998, the Manufacturing Skill Standards Council (MSSC) was formally recognized by the National Skill Standards Board (NSSB) as a voluntary partnership, consisting of all 15 sectors in manufacturing. The mission of the MSSC is to develop a nationwide system of workforce skill standards for manufacturing and related installation and repair workers. This nationwide system will encourage the use of world-class academic, occupational, and employability standards to guide continuous education and training for current and future workers. This system is in its final stages of development by industry in full partnership with employees, unions, education, and community stakeholders.

The proposed skill standards system will:

- create high skills-high wage jobs,
- provide credentials to facilitate skills portability, and
- better enable individuals to build rewarding career ladders in advanced high performance manufacturing workplaces.

Fueling the demand for skilled workers, the number of unskilled jobs available in manufacturing is shrinking rapidly – down to 15 percent of the manufacturing workforce by 2005 – as technology is transforming the workplace. Nearly 90 percent of manufacturers in the U.S. are now using computer-aided design, and more than two-thirds use computer-numerically controlled machine tools, statistical process control, just-in-time inventory control, total quality management, and computer-aided manufacturing.

— Manufacturing Skill Standards Council

Implementing STC: The Employer Participation Model

There are a number of means by which employers can help students develop skills and abilities. The National Employer Leadership Council's *Employer Participation Model* (EPM) provides a clear framework for employer activity. It is a resource for employers considering involvement in STC as well as education and community organizations searching for ways to reach out to employers.

MICA has built upon the NELC's Employer Participation Model by developing a framework that employer organizations can use to identify and define their activities within school-to-careers to support its members. *Making the Connections: Employer Associations' Actions for School-to-Career* recognizes the different roles an association might play at each level (local, state, and national); at the same time, it acknowledges the interdependence among the three levels. Employer groups can use *Making the Connections* to develop strategic plans for both internal and external purposes. *Making the Connections* covers three areas:

- identifying major constituents;
- understanding constituents' needs; and
- helping employers effect change.

Some of the activities described in the *Employer Participation Model* and *Making the Connections* are similar. When combined with the EPM, *Making the Connections* provides a continuum of actions that can be useful to both individual employers and organizations that support those employers.

This section focuses on EPM activities for working with students and teachers to highlight specific roles for employers and employer associations.

I. Working with Students

The NELC's *Employer Participation Model* and MICA's *Making the Connections* outline a continuum of activities in which employers and employer organizations can participate to support student learning. These activities help students: 1) become ***aware*** of the wide range of careers and the skills required to succeed in them; 2) ***explore*** different career areas of interest in a way that supports their academic achievement; and 3) ***prepare*** for direct or future entry into multiple career paths.

While not every employer provides every activity, a true STC "system" is one in which all these types of activities exist for students at all levels. In the best of initiatives, several or teams of employers work together to make sure the full spectrum of opportunities is available for students. The diagram below illustrates the progression of opportunities provided by employers for students.

Manufacturing Career Awareness

The manufacturing industry has changed considerably in the last century. Employers are working to dispel the notion that the only jobs available in the industry involve working on a production line. The fastest growing industries in manufacturing are either heavy users or producers of technology: industrial machinery, electronics, instruments, and transport equipment. Reflecting advanced skills and high productivity, total compensation in high-tech, high-trade manufacturing averaged $56,700 per worker in 1998, 35 percent higher than the average total compensation of $42,000 in the private sector.

In order to foster career awareness, employers can visit schools to discuss their work and host tours of businesses to share this information with a large number of students. An

"Stage"	Career Awareness	Career Exploration	Career Preparation
EPM Activity	Career Talks	Job Shadowing	Internships
	Career Days/Fairs	Job Rotations	Apprenticeship
	Worksite Tours		Mentoring

emphasis on the basic and core skills required of workers is an important component of Career Awareness activities. Employers often stress how the skills needed for success in manufacturing are developed through core math and science programs, in addition to other academic courses.

> ***"Technological advancements and increased engagement in the world economy are reshaping America's manufacturing workers into a force where brainpower is replacing muscle power."***
>
> **—National Association of Manufacturers**

Caterpillar, Inc.
Peoria, Illinois

Helping Young People Explore and Understand the Wide Opportunities in Manufacturing Careers

Looking to expand students' knowledge of opportunities in the skilled trades, Caterpillar teamed up with ten other business partners in the Peoria and Decatur areas to create the Get Into Manufacturing Skilled Trades program (GIMST). The program offers middle and high school students a hands-on opportunity to explore careers in manufacturing skilled trades.

In both cities, the companies funded and established Integrated Systems Technology labs. The labs provide study materials and exercises to show students design processes, manufacturing processes, quality-assurance techniques, automated material handling, fluidpower systems, and electrical and mechanical systems.

In an effort to promote career awareness, middle school students attend a five-day lab summer camp. Once they become familiar with the lab equipment, the students tour various manufacturing facilities where they observe plant production and meet with people in manufacturing occupations. More than 40 students attended the camp in the summer of 1999.

The high school component of the GIMST program allows participating juniors and seniors to divide their time between lab exercises and work-based learning. More than 70 students enrolled for the 2000-2001 school year.

In addition to student education, Get Into Manufacturing Skilled Trades has hosted more than 100 educators, counselors, and administrators in multiple day sessions to increase their understanding of manufacturing careers and show real-world applications of academic subjects.

Contact:
Ed Schwarze
(309) 675-2725
E-mail: Schwarze_Edward_A@cat.com
Website: www.getintoskilledtrades.com

The Timken Company
Canton, Ohio

Applying Skills Learned in the Classroom to the Workplace

Through their Kids and the Power of Work program (KAPOW), the Timken Company's Bucyrus Operations have partnered with two local school districts to provide elementary school children with a link between classroom studies and the workplace.

KAPOW exposes third graders to a variety of jobs in their community, teaching them workplace skills such as decision-making, teamwork, and positive work habits. More importantly, they discover that the skills learned in the classroom apply to the workplace.

After lessons and hands-on activities in the classroom, students from Kearsley Early Childhood Center and Sulphur Springs Elementary School annually visit the Timken Bucyrus Operations, where associates demonstrate how job responsibilities rely on skills learned in school.

In addition to their KAPOW program, the Timken Company has been involved in guiding the educational success of its community's students through a partnership with other businesses and philanthropic leaders designed to mobilize and coordinate private-sector resources to support the community's 150 schools. During the past decade, the partnership has raised more than $13 million from private resources for education projects such as:

- A summer arts institute;
- The Science and Math in Motion program;
- An after-school program to help average students reach their potential; and
- A camp for middle-school girls to foster interest in math and science.

Contact:
Michael L. Johnson
VP, Communications
The Timken Company
(330) 471-3910
E-mail: johnsomi@timken.com

Manufacturing Career Exploration

Career Awareness activities can open up doors for students who might not otherwise be interested in a manufacturing career. Exploration activities include job shadowing at a company or rotations through a series of companies to understand the range and scope of manufacturing skills applied in the workplace.

Kraft Foods, Inc.
Northfield, Illinois

Offering Opportunities to Experience the World of Work

For the past three years, the Northfield and Glenview headquarters of Kraft Foods, Inc., have participated in Job Shadow Day. In 1999, about 250 juniors and seniors from five Chicago-area high schools shadowed employees at the company's facilities for the day. Job shadowing allows for students to see, hear, and touch for themselves what their future can be, and better understand the need to bring marketable skills to the workplace. As part of the program, students discuss the whys and hows of making, transporting, and selling Kraft products. Through the course of these activities, students are exposed to finance, marketing, and operations.

In addition to Job Shadow Day, Kraft Foods is one of the leading providers of volunteers to Junior Achievement in the United States (JA), with more than 1,100 employees from headquarters, manufacturing, and sales locations volunteering, reaching more than 20,000 students.

The JA program provides volunteers with grade-specific, step-by-step teaching materials, activities, and discussions developed by education professionals. As JA volunteers, Kraft employees go directly into classrooms to teach business-oriented lessons to students in K-12. Classes are held weekly in local schools, during normal school hours, as a supplement to regular classroom social studies curriculum. Volunteers serve as role models to students, presenting important "real-world" business concepts through their diverse perspectives.

Contact:
Cathy Pernu
Kraft Foods
Three Lakes Drive
Northfield, IL 60093
(847) 646-3946
E-mail: cpernu@kraft.com

Maine Machine Products Company
South Paris, Maine

A Small Manufacturer Providing Career Opportunities

Maine Machine Products Company has been actively involved in many local K-12 education projects for more than 25 years.

To offer clear opportunities for career preparation, the company has supported the Maine Career Advantage program for aspiring engineers/CAD designers, and was the first company to hire a student intern through the program. Selected students make a three-year commitment to the program, alternating work and training in the Maine Machine Product's plant (five days) with regular classroom studies (five days) every two weeks. The students work

(continued)

for the company full-time in the summer, with the school-year program and summer employment culminating in a full scholarship at a technical college.

Maine Machine Products also provides two-year associate degree scholarships for Machine Tool Technology (an affiliation with the local technical college). More than $125,000 on tuition alone has been provided, with countless hours of in-house training as part of work-study.

Maine Machine Products also offers opportunities for career awareness with younger students. Each year, 40 to 60 third graders spend half the day with a Maine Machine Products engineer in their schools, correlating simple machines to "real world" manufacturing. The students follow up with a half-day tour of the company's plant. In addition, the company invites legislators, teachers, parents, and guidance counselors to visit the plant yearly to stay connecting with the company and industry have to offer.

The company rounds out its education involvement by working with teachers. The company's "Workshop On Wheels" program is designed to get teachers into area businesses and help them understand the opportunities available for, and the skills needed from, their students. Through plant tours and question and answer sessions, the teachers learn how to carry this information back to their classrooms.

Contact:
David Sutton
Maine Machine Products Company
(207) 743-6344
E-mail: dsutton@mmpco.com

Manufacturing Career Preparation

Employers are also playing key roles to help students reinforce their academic skills and support their entry into manufacturing careers by offering intensive work-based learning and mentoring opportunities. Career preparation activities include internships, apprenticeships, and mentoring. These activities can stress the importance of industry-based standards, such as those identified by MSSC, to help students benchmark their skills to those required in the industry.

Advanced Micro Devices
Austin, Texas

A Comprehensive School-to-Careers Initiative

Advanced Micro Devices (AMD) operates one of the most effective and comprehensive school-to-careers initiatives in the semiconductor industry.

(continued)

AMD has introduced a two-year Accelerated Careers in Electronics (ACE) program at eight high schools in the Austin, Texas area. ACE students participate in a ten-week paid summer internship at AMD. While completing the internship, students are paired one-on-one with a mentor and receive hands-on experience.

They also receive classroom instruction on personal computers, time management, and presentation skills. This experience allows students to earn up to 16 college credits towards an Associate s degree in Semiconductor Manufacturing Technology at Austin Community College (ACC), and offers articulation agreements with several four-year universities.

To help create a well-rounded series of work-based learning opportunities in Austin, AMD has established strong partnerships with area middle schools.

Beginning in eighth grade, students are exposed to the semiconductor manufacturing industry through career day talks, facility tours, and job shadowing.

AMD's work-based learning initiatives demonstrate how school-to-careers can dramatically improve the number of qualified workers entering an industry. For example, as part of the ACE initiative, AMD works directly with secondary and post-secondary teachers on curriculum development to ensure that the skills being developed in the classroom are relevant for the industry. Recent statistics reveal these efforts have been enormously successful. Ninety-eight percent of the students in ACC's Associate s degree program obtain jobs in the industry. Nearly half are directly hired by AMD.

Through targeted efforts to local students, teachers, schools, and civic groups, AMD's comprehensive school-to-careers activities serve as an exemplary model. Not only do they manufacture success for students but also for the semiconductor industry.

Contact:
Allyson Peerman
Manager, Corporate Community Affairs
Advanced Micro Devices
5204 East Ben White Blvd., MS529
Austin, TX 78741
(512) 602-5501
E-mail: allyson.peerman@amd.com
Website: www.amd.com

II. Working with Teachers

Teachers serve as the direct link to student learning, and employers can help teachers support the learning of students participating in career awareness, exploration, and preparation activities. Exposure to and guidance from employers ensures that teachers reinforce in the classroom the skills that students develop through STC initiatives. As outlined in the *Employer Participation Model*, the connection between employers and teachers occurs in two primary ways:

- **Employers Working Directly with Teachers.** Direct connections between employers and educators are critical to

highlighting the academic skills required in manufacturing and demonstrating the value of contextual learning to student achievement. Employers can work with teachers to develop classroom projects and school-based enterprises that help students make continued connections to the workplace. Short- and long-term teacher externships allow teachers to spend time at a workplace to see first-hand the demands of the industry. Teachers can then work with employers and other educators to apply lessons learned in the classroom to benefit students.

- **Employers Supporting the Work of Teachers.** Employers have important roles to play in

Rochester Area Career Education Collaborative (RACEC) Rochester, New York

Creating Career Education Resources

The Rochester Area Career Education Collaborative (RACEC) is a collaborative of educators and employers, created by the Industrial Management Council of the city. RACEC's core services focus on providing professional development opportunities for educators. These opportunities include facilitating career education courses and arranging internships for educators.

RACEC's career education courses include a structured series of workplace visits at the end of school day, from 3:30 to 6:30 p.m. A course is held once per year and focuses on an orientation to varied occupational environments or a specific industry or field. RACEC's "long course" offering is comprised of ten sessions that are held over several months for a total of 30 contact hours. In this course, participants visit nine workplaces across a broad range of industries. The course is targeted at school counselors and school-to-careers coordinators. Participants tour worksites, interface with company personnel, and wrap-up each session with a panel discussion with key management. RACEC also offers "mini-courses" which are comprised of five sessions held over a two-month period for a total of 15 contact hours. Additionally, RACEC has developed a one-day workshop, called "Educator Worksite Visits," which consists of a morning worksite visit for teams of educators followed by a full group debriefing session.

RACEC's Educator Internship Experience provides six-week paid internships for K-12 educators, who deliver value-added, professional work for participating employers. During the academic year following the internship, educators implement a career infusion plan, present key learning to school district faculty, and attend three follow-up meetings conducted by RACEC.

Contact:
The Industrial Management Council
The Hutchinson House
930 East Avenue
Rochester, NY 14607-2296
(716) 244-8835; Fax: (716) 244-4864

helping teachers use workplace experiences to promote student achievement. Employers can work with teachers to develop curriculum and instructional materials that directly help students build basic communication, teamwork, and problem solving skills. Equally important is integrating industry skill standards into academic standards to promote student academic achievement through contextual, work-based experiences.

Eastman Chemical Company
Kingsport, Tennessee

Providing Learning Opportunities for Teachers

Recognizing that continued access to skilled employees and engineers in the future relies on the effectiveness of the local school systems, the Eastman Chemical Company in Kingsport, Tennessee, developed a structured business-education partnership in the early 1990s. The resulting "Putting Children First" program focuses specifically on strengthening students' math and science skills.

A notable feature of "Putting Children First" is the educator-on-loan program, which enables teachers to develop in-depth knowledge about work skills needed in high-tech manufacturing jobs. Three teachers / educators-on-loan work on-site at Eastman for two years on an ongoing, rotational basis. While there, the teachers learn about manufacturing processes and the skills required, facilitate employee involvement in schools to improve math, science, technology, and language arts skills, and develop learning tools and programs to increase the academic and employability skills of all students. In addition to teacher training and tools development, the program can target a particular issue for special attention.

Teachers actively pursue the teacher-on-loan positions and eagerly rotate into Eastman in order to learn about manufacturing and continuously improve math and science teaching tools and professional development opportunities.

The partnership between Eastman Chemical Company and Kingsport-area schools has also produced the Appalachian Inter-Mountain Scholars Program (AIMS) to encourage students to take rigorous math and science courses. If students join the program, complete the AIMS core curriculum, and maintain a C average in the required courses, they can become AIM Scholars. As an incentive for students to participate in this program, many area employers have committed to giving hiring preference to AIM Scholars.

Contact:
Teresa Shaffer
Eastman Chemical Company
Education Initiatives
P.O. Box 431
Kingsport, TN 37662
(423) 229-6962
E-mail: shaffert@eastman.com
Website: www.eastman.com

Third Party Intermediaries

Employer involvement is often facilitated by an "intermediary" organization. Intermediaries serve as third-party "brokers" who ensure that partnerships between employers and educators meet their intended goals and maintain quality. They convene the key partners to determine what types of programs and policies are needed to meet the goals of both business and education. Once this set of programs and policies is outlined, they provide direct services to employers, educators, and young people to ensure that the needs and expectations of all are being met and that additional partners are recruited and engaged in the emerging system.

Manufacturers and other employers best respond to and learn from their peers. The natural place for manufacturers to learn about school-to-careers and gain assistance is through employer associations. This is why MICA engages and supports employer involvement in school-to-careers activities through the National Association of Manufacturers' network of 48 state business and industry associations, 69 independent local

Connecticut Business and Industry Association
Hartford, Connecticut

Bringing Businesses and Educators Together for Enhanced Success

Working to address the needs of educators, students, and employers, the Connecticut Business and Industry Association (CBIA) is the statewide business partner of Connecticut's school-to-careers efforts. For educators and students, CBIA has produced clear information booklets and career videos outlining the industry requirements for eight broad career clusters, including manufacturing technology.

CBIA has developed institutes and guidebooks for employer involvement as well as an employer incentive grant program, funding local chambers of commerce, business and trade associations, and other employer groups to involve their members directly in school-to-careers initiatives at the local and regional level.

In addition, CBIA is working to provide eleventh and twelfth graders a virtual workplace experience through SciTeKS (Science Technology: Knowledge and Skills), a novel program of study created by the American Chemical Society.

Contact:
Lauren Weisberg Kaufman
Connecticut Business and Industry Association
350 Church Street
Hartford, CT 06103
(860) 244-1938
E-mail: kaufmanl@cbia.com

and regional employer and manufacturing associations, and 220 manufacturing industry associations.

The Capital Area Training Foundation
Austin, Texas

Employer Recruiting

The Capital Area Training Foundation (CATF) is an employer-driven intermediary that supports employer priorities in school-to-careers and workforce development activities. CATF acts as a broker between employers and local schools in the Austin, Texas region. Staff members, together with volunteers, support the work of industry-sector steering committees. These committees are responsible for engaging employers in designing career pathways, providing work-based learning experiences to students and teachers, and linking employers directly with schools and postsecondary institutions.

Most of CATF's school-to-careers activities are devoted to providing organizational support for, and staffing of, its six industry-sector steering committees. In addition to employer members, each steering committee includes representation from educators engaged in school-to-careers academic programs in area schools and from community organizations and local colleges.

Contact:
Capital Area Training Foundation
5930 Middle Fiskville Road
Suite 507.6
P.O. Box 15069
Austin TX, 78761-5069
(512) 323-6773
Website: www.catf-austin.org

Next Steps

Greater numbers of employers are participating in STC to help young people develop the skills integral to success in the 21st Century. To get involved:

- **Find out what is happening around school-to-careers in your state and community.** Every state has a STC director and office, and most communities house local STC partnerships. Contacting these individuals and organizations to express your interest in STC will help them connect you and create opportunities to work with teachers and students.

For more information, contact:
National School-to-Work Office
400 Virginia Avenue, SW, Suite 210
Washington, DC 20024
(800) 251-7236; Fax: (202) 488-7395
E-mail: stw-lc@ed.gov
Website: www.stw.ed.gov

- **Access information specific to manufacturing through the Manufacturing Industries Career Alliance (MICA).** MICA has provided financial and technical support to employer association and state association group affiliates and industry groups that are working with the state school-to-careers officials and state and local employer associations. One of the purposes of MICA is to identify and promote promising practices by researching existing success stories, such as how corporations benefit from school-to-careers.

  For more information, contact:
  Phyllis Eisen
  Vice President
  The Manufacturing Institute
  Executive Director
  Center for Workforce Success
  National Association of Manufacturers
  1331 Pennsylvania Avenue, NW
  Washington, DC 20004-1790
  (202) 637-3011
  E-mail: peisen@nam.org

  Joan Wills
  Director
  Center for Workforce Development
  Institute for Educational Leadership
  1001 Connecticut Avenue, NW, Suite 310
  Washington, DC 20036
  (202) 822-8405 x103
  E-mail: willsj@iel.org
  Information is available through the MICA website at www.nam.org/workforce.

- **Join the National Employer Leadership Council.** NELC members receive frequent updates and resources on employer involvement in STC, and become part of a network of thousands of employers who are working together to build STC opportunities for all.

  For more information, contact:
  National Employer Leadership Council
  c/o National Alliance of Business
  1201 New York Avenue, NW, Suite 700
  Washington, DC 20005
  (800) 360-NELC; Fax: (202) 822-8026
  E-mail: nelc@nelc.org
  Website: www.nelc.org

- **Check out these other key organizations and resources:**

  Center for Workforce Success
  National Association of Manufacturers
  1331 Pennsylvania Ave., NW
  Washington, DC 20004-1790
  (202) 637-3000
  E-mail: jgolden@nam.org
  Website: www.nam.org/workforce

  National Alliance of Business
  1201 New York Avenue, NW, Suite 700
  Washington, DC 20005
  (800) 787-2848; Fax: (202) 289-1303
  E-mail: info@nab.com
  Website: www.nab.com

  Manufacturing Skill Standards Council
  c/o NACFAM
  1201 New York Ave, NW, Suite 725
  Washington, DC 20005
  (202) 216-2745; Fax: (202) 289-7618
  Website: www.msscusa.org

  Working for America Institute
  888 16th Street, NW, Suite 300
  Washington, DC 20006
  (202) 466-8010; Fax: (202) 466-6147
  Website: www.workingforamerica.org

Glossary of Terms

The following terms, used throughout this publication, come from the NELC's *Employer Participation Model,* a guide designed to help employers structure their involvement in school-to-careers. For additional information or to receive copies of the EPM, please contact the NELC directly.

Career Awareness

- *Career Talks:* Employers and employees visit students in the classroom and explain the work in their industry or company.
- *Career Days/Career Fairs:* Special events are typically held to allow students to meet with postsecondary educators, employers and employees, or human resource professionals to learn about education and work opportunities. Career day activities are designed to help students think about their interests and abilities in relation to potential careers.
- *Worksite Tours:* Students visit the worksite, talk with employees, and observe the workplace activities.

Career Exploration

- *Job Shadowing:* A student follows an employee at a company location to learn about a particular occupation or industry. Job shadowing can help students explore a range of career objectives and select a career major for the latter part of high school.
- *Job Rotations:* At a worksite, students transfer among a number of positions and tasks that require different skills and responsibilities in order to understand the steps that go into creating a product and/or service, how their own effort affects the quality and efficiency of production and customer service, and how each part of the organization contributes to productivity.

Career Preparation

- *Internships:* Students work for an employer for a specified period of time to learn about a particular industry or occupation. Students' workplace activities may include special summer projects, a sample of tasks from different jobs, or tasks from a single occupation. These may or may not include financial compensation.
- *Apprenticeship*
  - > *Youth Apprenticeship:* A multi-year program that combines school- and work-based learning in a specific occupational area or occupational cluster and is designed to lead directly into either a related postsecondary program, entry-level job, or registered apprenticeship program. Youth Apprenticeships may or may not include financial compensation.
  - > *Apprenticeship (Registered):* Registered apprenticeship programs meet specific federally-approved standards designed to safeguard the welfare of apprentices. The programs are registered with the Bureau of Apprenticeship and Training (BAT), U.S. Department of Labor, or one of 27 State Apprenticeship Agencies or Councils approved by BAT. Apprenticeships are relationships between an employer and employee during which the worker, or apprentice, learns an occupation in a structured program sponsored jointly by employers and labor unions or operated by employers and employee associations.
- *Mentoring:* Employee(s) who possess the skills and knowledge to be mastered by a student, and who instructs the student, critiques the performance of the student, challenges the student to perform well, and works in consultation with teachers or youth organizations and the employer of the student.

Building on the NELC Agenda

The National Employer Leadership Council is a business membership organization dedicated to expanding and enhancing employer involvement in school-to-careers. The NELC advocates and supports school-to-careers initiatives combining classroom courses with real-life learning to ensure all students meet high standards and, therefore, are prepared for continuing education and the cutting-edge jobs of the 21st Century. NELC members, and the NELC Leadership Board of senior business executives, are committed to sustaining the significant changes in teaching and learning taking place across the country as a result of school-to-careers.

The NELC recognizes that as the knowledge economy continues to experience rapid change in the nature of work and the type of jobs available, an increasing number of employers, educators, and community organizations are striving for a seamless education system that equips individuals with knowledge that can be upgraded continuously. These systems will be based on defining and articulating strategies for building "knowledge networks" that help align education and training activities directly with employer demand.

The development of these systems requires an understanding of how skill needs link to skill development. The employer community and, as a result, the NELC, is advocating for national, state, and local education and training systems built on four common principles:

- A clear process for determining and understanding **employer demand.** This includes regular and ongoing information on the foundational ("soft") and academic skills required of all workers, as well as the occupation- and industry-specific skills required in a variety of jobs.
- Methods to set **benchmarks and standards for competency based directly on this employer demand.** Critical to this principle is ensuring that programs measure what individuals can do in order to ensure that employer needs will be met.
- **Certification and credentialing** of these skills and abilities that are valued and used by employers in the hiring, re-training, and education investment processes.
- Supporting **curriculum and programs designed to build these competencies and leading to these certificates and credentials.**

To find out more, contact: **National Employer Leadership Council,** c/o National Alliance of Business, 1201 New York Avenue, NW, Suite 700, Washington, DC 20005, Phone: (800) 360-NELC, E-mail: nelc@nelc.org; Website: www.nelc.org

The work of the NELC is supported by the employer community and the National School-to-Work Office, a joint initiative of the U.S. Departments of Education and Labor.